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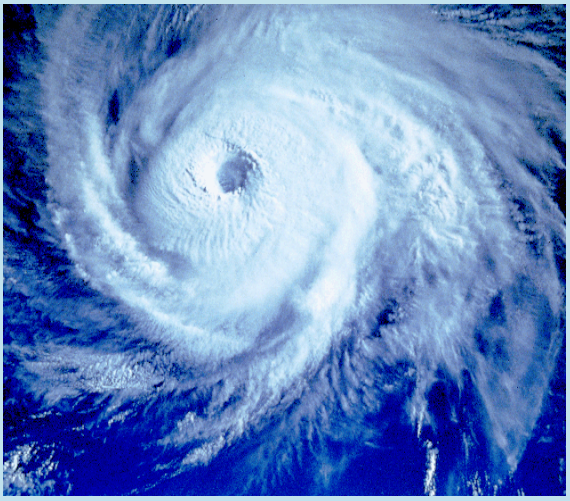
MICHAEL CRICHTON AND GLOBAL WARMING

by David B. Sandalow

How do people learn about global warming?

That – more than the merits of any scientific argument – is the most interesting question posed by Michael Crichton's State of Fear.

The plot of Crichton's 14th novel is notable mainly for its nuttiness – an MIT professor fights a well-funded network of eco-terrorists trying to kill thousands by creating spectacular "natural" disasters. But Crichton uses his book as a vehicle for making two substantive arguments. In light of Crichton's high profile and ability to command media attention, these arguments deserve scrutiny.



First, Crichton argues, the scientific evidence for global warming is weak. Crichton rejects many of the conclusions reached by the National Academy of Sciences and Intergovernmental Panel on Climate Change — for example, he does not believe that global temperature increases in recent decades are most likely the result of human activities. In challenging the scientific consensus, Crichton rehashes points familiar to those who follow such issues. These points are unpersuasive, as explained below.

Second, Crichton argues that concern about global warming is best understood as a fad. In particular, he argues that many people concerned about global warming follow a herd mentality, failing critically to examine the data. Crichton is especially harsh in his portrayal of other members of the Hollywood elite, though his critique extends more broadly to the news media, intelligentsia and general public. This argument is more interesting and provocative, though ultimately unpersuasive as well.

1. Climate Science

Crichton makes several attempts to cast doubt on scientific evidence regarding global warming. First, he highlights the "urban heat island effect." Crichton explains that cities are often warmer than the surrounding countryside and implies that observed temperature increases during the past century are the result of urban growth, not rising greenhouse gas concentrations.

This issue has been examined extensively in the peer-reviewed scientific literature and dismissed by the vast majority of earth scientists as an inadequate explanation of observed temperature rise. Ocean temperatures have climbed steadily during the past century, for example — yet this data is not affected by "urban heat islands." Most land glaciers around the world are melting, far away from urban centers. The Intergovernmental Panel on Climate Change, using only peer-reviewed data, concluded that urban heat islands caused "at most" 0.05°C of the increase in global average temperatures during the period 1900-1990 — roughly one-tenth of the increase during this period. In contrast, as one source reports, "there are no known scientific peer-reviewed papers" to support the view that "the heat island effect accounts for much or nearly all warming recorded by land-based thermometers."

Second, Crichton argues that global temperature declines from 1940-1970 disprove, or at least cast doubt on, scientific conclusions with respect to global warming. Since concentrations of greenhouse gases were rising during this period, says Crichton, the fact that global temperatures were falling calls into question the link between greenhouse gas concentrations and temperatures.

Crichton is correct that average temperatures declined, at least in the Northern Hemisphere, from 1940-1970. Temperature is the result of many factors, including the warming effects of greenhouse gases, the cooling effects of volcanic eruptions, changes in solar radiation and more. (Think of a game of tug-of-war, in which the number of players on each team changes frequently.) The fall in Northern Hemisphere temperatures from 1940-1970 reflects the relative weight of cooling factors during that period, not the absence of a warming effect from man-made greenhouse gases.

Should we at least be encouraged, recalling the decades from 1940-1970 in the hope that cooling factors will outweigh greenhouse warming in the decades ahead? Hardly. Greenhouse gas concentrations are now well outside levels previously experienced in human history and climbing sharply. Unless we change course, the relatively minor warming caused by man-made greenhouse gases in the last century will be dwarfed by much greater warming from such gases in the next century. There is no basis for believing that cooling factors such as those that dominated the temperature record from 1940-1970 will be sufficient to counteract greenhouse warming in the decades ahead.

Third, Crichton offers graph after graph showing temperature declines during the past century in places such as Puenta Arenas (Chile), Greenville (South Carolina), Ann Arbor (Michigan), Syracuse (New York) and Navacerrada (Spain). But global warming is an increase in global *average* temperatures. Nothing about specific local temperature declines is inconsistent with the conclusion that the planet as a whole has warmed during the past century, or that it will warm more in the next century if greenhouse gas concentrations continue to climb.

Crichton makes other arguments, but a point-by-point rebuttal is beyond the scope of this paper. (A thoughtful rebuttal of that kind can be found at www.realclimate.org.) Climate change science is a complex topic, not easily reduced to short summaries. But a useful contrast with Crichton's science-argument-within-an-action-novel is the sober prose of the U.S. National Academy of Sciences. The opening paragraph of a 2001 National Academy report responding to a request from the Bush White House read:

> "Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Temperatures are, in fact, rising. The changes observed over the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes is also a reflection of natural variability. Human-induced warming and associated sea level rises are expected to continue through the 21st century. Secondary effects are suggested by computer model simulations and basic physical reasoning. These include increases in rainfall rates and increased susceptibility of semi-arid regions to drought. The impacts of these changes will be critically dependent on the magnitude of the warming and the rate with which it occurs."

Climate Change Science: An Analysis of Some Key Questions, National Academies Press (2001).

Time will tell whether this report or Crichton's novel will have a greater impact on public understanding of global warming.

2. Climate Fad

This raises the second, more interesting argument in Crichton's novel. Crichton argues that concern about global warming has become a fad embraced by media elites, entertainment moguls, the scientific establishment and general public. In Crichton's view, many assertions are accepted as fact without critical analysis by the vast majority of those who have views on this issue.

On the last point, fair enough. There are indeed fewer people who have sorted through the minutiae of climate change science than have opinions on the topic. In this regard, global warming is like Social Security reform, health care finance, the military budget and many other complex public policy issues. As Nelson Polsby and Aaron Wildavsky once wrote, "Most people don't think about most issues most of the time." When forming opinions on such matters, we all apply certain predispositions or instincts and rely on others whose judgment or expertise we trust.

Of course this observation applies as well to the economics of climate change. The perception is widespread in many circles that reducing greenhouse gas emissions will be ruinously expensive. How many of those who hold this view have subjected their opinions to critical analysis? Crichton never musters outrage on this topic.

Crichton's complaints are particularly striking in light of the highly successful efforts to provide policymakers and the public with analytically rigorous, non-political advice on climate science. Since 1988, the Intergovernmental Panel on Climate Change has convened thousands of scientists, economists, engineers and other experts to review and distill the peer-reviewed literature on the science on global warming. The IPCC has produced three reports and is now at work on the fourth. In addition, the National Academy of Sciences has provided advice to the U.S. government on this topic, including the report cited above.

Crichton's view that the American media provides a steady drumbeat of scary news on global warming is especially hard to fathom. Solid data are scarce, but one 1996 analysis found that the rock star Madonna was mentioned roughly 80 times more often than global warming in the Lexis-Nexis database. Certainly one could watch the evening news for weeks on end without ever seeing a global warming story.

Furthermore, the print media's "on the one hand, on the other hand" convention tilts many global warming stories strongly toward Crichton's point of view. As Crichton would concede, the vast majority of the world's scientists believe that global warming is happening as a result of human activities and that the consequences of rising greenhouse gas emissions could be very serious. Still, many news stories on global warming include not just this mainstream view but also the "contrarian" views of a very small minority of climate change skeptics, giving roughly equal weight to each. As a result, public perceptions of the controversy surrounding these issues may be greatly exaggerated.

Crichton's most serious charge is that "open and frank discussion of the data, and of the issues, is being suppressed" in the scientific community. As "proof," he offers the assertion that many critics of global warming are retired professors no longer seeking grants. Whether there is any basis for these assertions is unclear, but if so Crichton should back up his claims with more than mere assertions in the appendix to an action novel.

Indeed Crichton should hold himself to a higher standard with regard to all the arguments in his book. He is plainly a very bright guy and, famously, a Harvard Medical School graduate. A millionaire many times over, he doesn't need to be seeking grants. If he has something serious to say on the science of climate change, he should say so in a work of nonfiction and submit his work for peer review. The result could be instructive – for him and us all.

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